Remarks

Claims 1-23 are pending in the application. Claims 1-19 are rejected, while claims 20-23 are withdrawn from consideration. By this paper, claims 1, 2, 4, 6-10, 12, 15-17 and 19 are amended, and claims 20-23 are canceled. Based on the following, consideration of the amended claims, and reconsideration of the remaining claims, are requested.

Claim Rejections—35 U.S.C. § 101

The Examiner rejected claims 1-19 under 35 U.S.C. § 101, stating that "the claimed invention is directed to non-statutory subject matter." In particular, the Examiner states that "Applicant is essentially attempting to preempt others from applying a 'known mathematical relationship', and using an equation representing said mathematical relationship relating the velocity of an engine and the velocity of a first motor..., and thereform [sic] determining whether a 'mathematical combination' of the velocities of the engine and motor are within a predetermined speed range." The Examiner further states that "[t]his is the equivalent of nothing more than an abstract idea, law of nature or even a natural phenomenon...."

At the outset, Applicants reiterate the explanation in the remarks sections of the amendment filed 26 June 2006, regarding the § 101 rejections, the entirety of which is incorporated herein by reference. By stating that Applicants are attempting to preempt others from applying a known mathematical relationship and using an equation representing the mathematical relationship, the Examiner has failed to comprehend the end use of these steps, which is to validate the velocities of certain torque producing machines. In this regard, Applicants submit that claims 1-19 as originally filed, and as amended in the 26 June 2006 amendment, are fully compliant with the requirements of § 101.

The foregoing notwithstanding, a number of claims of the present application have been amended by this paper to more particularly point out and distinctly claim the subject

matter of the invention. For example, amended claim 1 recites a method for validating engine and motor velocities that includes using a determined engine velocity and a measured velocity of a first motor in a first equation. The first equation includes the use of a first velocity relationship mathematically relating the engine velocity and the velocity of the first motor based on the vehicle architecture. In addition to this step, amended claim 1 now separately recites the step of "validating the determined engine velocity and the measured velocity of the first motor when the mathematical combination of at least the engine velocity and the velocity of the first motor is within [a] first predetermined speed range." In addition, it is the "determined engine velocity" (based on a measured engine speed) and the "measured velocity of the first motor" that are being validated. Thus, it is clear that certain measurements of speed and velocity are validated based on an equation using a first velocity relationship. This is much more than "an abstract idea, law of nature or even a natural phenomenon" as suggested by the Examiner.

According to amended claim 1, specific speed and velocity measurements are taken, a first equation is used that mathematically relates engine velocity and the velocity of the first motor, and the determined engine velocity and the measured velocity of the first motor are then validated when their mathematical combination is within a first predetermined speed range. As discussed throughout the specification, validating measurements of speed and velocity is a very useful tool to help ensure the accuracy of the speed and velocity values being used, for example, by a vehicle control system when it makes decisions on how to control the powertrain of a vehicle. If, for example, the control system of the vehicle receives a signal indicating that the engine speed is low, and the control system increases the engine speed significantly to meet driver demand, it is important that the engine speed really was low, and that the control system was not fed erroneous information by the signal it received. One way to accomplish the validation required to provide assurance that the signal was accurate, is to use two separate sensors on the engine to measure the speed. The present invention, however, provides an advantage over such systems in that it uses a known mathematical relationship and a velocity sensor that is already used to measure the velocity of another device. Once the determined engine velocity and the measured velocity of the first motor have been validated according to the positively recited step in amended claim 1, these values can be used by the

vehicle control system with confidence that the powertrain will be controlled in a manner that produces the effect desired by the vehicle operator.

Similarly, amended claim 10 recites measuring engine speed to facilitate determination of an engine velocity, and measuring the velocity of first and second motors. The determined engine velocity and measured velocity of the first and second motors are mathematically combined and compared to a first predetermined speed range. In addition, amended claim 10 recites the step of "validating the determined engine velocity, the measured velocity of the first motor, and the measured velocity of the second motor when the first combined speed term is within the first predetermined speed range." Again, the step of validating these velocities is not an abstract idea, but rather, helps to ensure that these determined and measured velocities are accurate so that they can be used with confidence, for example, by a powertrain control module or other control system.

In addition to the amendments to claims 1 and 10, additional claim amendments are provided to more particularly point out and distinctly claim the subject matter of the invention. For example, claims 6, 8, 9, 12 and 16 each positively recite the step of validating certain determined and measured velocities. Moreover, claims 2, 4, 7, 15, 17 and 19 each add the words "determined" and "measured" to respectively describe the engine and motor velocities; this provides even greater clarity that the validation is of specific determined or measured velocities, rather than to abstract values. Claim 1 is also amended so that the step of measuring the velocity of the first motor now uses the definite article "the" rather than the indefinite article "a", since the first motor is previously recited in the preamble of the claim. Finally, claim 4 is amended to depend from claim 2, rather than claim 1, thereby providing antecedent basis for "the at least one additional equation", which is introduced in claim 2. Based on the foregoing, Applicants respectfully request that the § 101 rejections be withdrawn.

Claim Rejections—35 U.S.C. § 102

The Examiner rejected claims 1-19 under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,654,648 (Nada et al.). The Examiner states that "Nada et al.

discloses a technique of monitoring abnormality in plural CPUs or controllers of a hybrid vehicle...." The Examiner cites to "the top of the flowchart of figure 10 which teaches determining whether the motor speeds are within a preset/predetermined range, and in the next step therefrom determining if there is an 'occurrence of abnormality' in step S320."

At the outset, Applicants point out the very rigorous requirements for establishing a *prima facie* case of anticipation, as expressly recited in the MPEP. The MPEP states that "'a claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.'" MPEP § 2131, 8th ed., Rev. 3 (citation omitted). The MPEP further states that "'[t]he identical invention must be shown in as complete detail as is contained in the... claim.'" *Id.* (citation omitted). An examination of Figure 10 indicates that step S310 is a decision block in which it is determined whether "motor speeds are within [a] preset range." Contrary to what the Examiner states, the next step therefrom is not necessarily step S320, but rather, that step is completely bypassed if the answer to the question in decision block S310 is "yes". Even if, however, the answer determined in decision block S310 is "no", step S320 does not anticipate any of the claims of the present application, even when taken in combination with all of the other steps shown in Figure 10. For example, Nada et al. specifically describes the flowchart shown in Figure 10 in column 20, lines 33-53. It is clear from this description that at decision block S310 two different motor speeds are independently determined to see if they are within a *corresponding* speed range—i.e., each motor speed is separately compared to a speed range. There is no mathematical relationship or equation used to combine these speeds and compare this combination to a single predetermined speed range, as specifically recited in independent claims 1 and 10 of the present application.

The Examiner further states that in column 8, line 39 - column 9, line 44, "Nada et al. particularly discloses the relationship between the basic operation of a hybrid vehicle and the relative shaft speeds of each of the motors and engines due to the fact that they are all connected through a planetary gearbox whereby the various shaft speeds then hold certain relationships depending on the gear ratio, etc." The Examiner further states that the bottom of column 8 in Nada et al. "gives several equations relating the shaft speeds depending on the

number of teeth on the sun and ring gears of the planetary gearbox, by means of which it is determined whether or not there is an abnormality depending on whether the net result for an equation falls within a predetermined range (as taught in the lower portion of column 5)."

Although there are a number of equations presented in column 8 of Nada et al., there is no description of using any of these equations to determine anything about an abnormality either in column 8, or as suggested by the Examiner, in the lower portion of column 5. In fact, the lower portion of column 5 describes the use of multiple controllers to check the results of arithmetic logic operations to verify the validity of the processing of another controller. Nowhere in column 5 is it expressly or inherently described that the arithmetic logic operations are in any way related to the speed and torque equations provided in column 8. The fact that Nada et al. describes a technique for monitoring abnormalities in a plurality of CPUs does not provide the basis for meeting the rigorous requirements of a establishing a *prima facie* case of anticipation, as specifically enumerated in the MPEP. Therefore, Applicants respectfully request that the § 102 rejections be withdrawn.

By this paper, non-elected claims 20-23 are canceled. As discussed in detail above, Applicants believe that claims 1-19 meet all of the requirements of § 101, and are not anticipated by Nada et al., and therefore, Applicants believe that this application is now in a condition for allowance.

Respectfully submitted,

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